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YouTube Channel : https://youtube.com/channel/UCK1_Op30_pZ1zBs9l3HNyBw (Priya Frontend Vlogz)

useCallback

What is useCallback hook:

- The useCallback Hook returns a memoized callback function.
- It allow us to cache a function definition and it does not get redefined on every render.
- It will not run on every render automatically. This will optimize and improve the overall performance of your application.

When to use the useCallback hook:

- When you need to pass a function as props to a child component.
- If you have a function that is expensive to compute and you need to call it in multiple places.
- When dealing with functional components.

Benefits of using the useCallback hook:

- Performance optimization: This hook optimizes the performance of your application by preventing a series of unnecessary re-rendering in your components.
- Restricting rendering of child components: The useCallback hook in React allows us to selectively render important child components in a parent component. By using the useCallback hook, we can create memoized functions and pass them as props to child components. This ensures that only the necessary child components are rendered and updated when specific actions occur, resulting in improved performance.
- Preventing memory leaks: Since the hook returns the memoized function, it prevents recreating functions, which can lead to memory leaks.

Drawbacks of the useCallback hook:

- Complex code: Only use the hook only when you need to memoize an expensive function which needs to be passed down to children components as a prop, otherwise, it will create a complex code structure too.
- Excessive memory usage: If you do not use the useCallbck hook properly, it can lead to excessive memory usage. For instance, if a memoized function holds onto references to objects or variables that are no longer needed, those resources may not be freed up by garbage collection and could use more memory than needed.

The useCallback syntax:

It takes two arguments: the function you want to memoize, and the dependencies array. i.e, useCallback(function, dependencies).

Returns:

On the initial render, useCallback returns the function you have passed.

During subsequent renders, it will either return an already stored function from the last render (if the dependencies haven't changed), or return the function you have passed during the current render.

Referential equality:

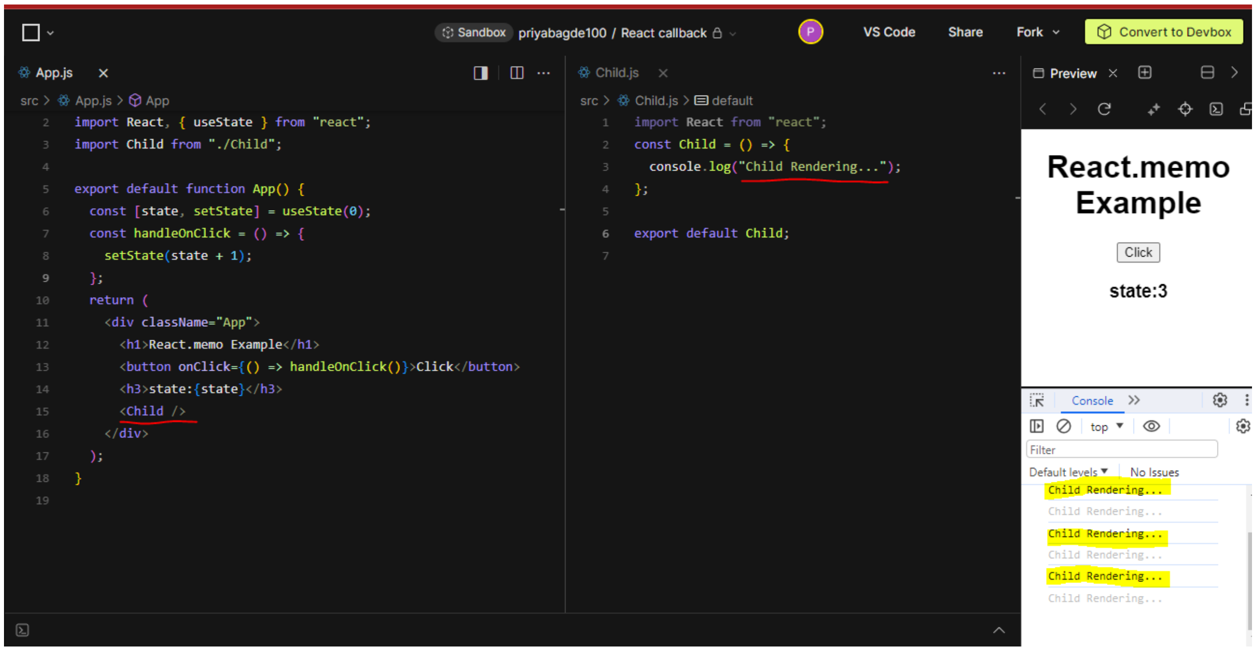
When a component re-renders, every function (like handleOnClick/ handleOnChange) inside of that component is recreated and therefore these functions'(i.e, objects) references change between renders and all the deeply nested child components get call unnecessarily. Using useCallback, instead of recreating the function object on every re-render, we can use the same function object between renders.

useMemo vs useCallback:

The main difference is that useMemo returns a memoized *value* and useCallback returns a memoized *function*.

Example:

Suppose we have a counter at parent component and inside a child component(we just have a console.log()). When we increment the counter at parent as state is not used at child component so why is the child component get re-render unnecessarily. To avoid this case, for that we have to wrap the child component by React.memo(Child).



App.js:

```
import React, { useState } from "react";
import Child from "./Child";

export default function App() {
  const [state, setState] = useState(0);
  const handleOnClick = () => {
    setState(state + 1);
  };
  return (
    <div className="App">
      <h1>React.memo Example</h1>
      <button onClick={() => handleOnClick()}>Click</button>
      <h3>state:{state}</h3>
      <Child />
    </div>
  );
}
```

Child.js:

```
import React from "react";
const Child = () => {
  console.log("Child Rendering...");
};

export default Child;
```

Preview:

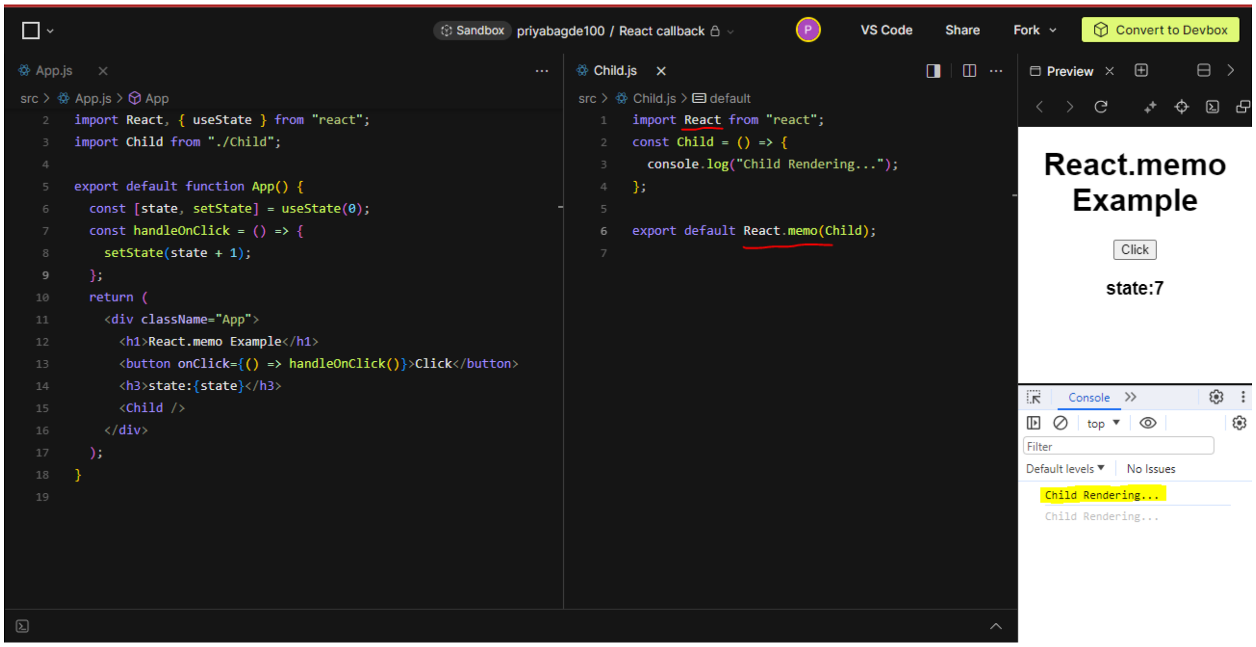
React.memo Example

Click

state:3

```
Child Rendering...
Child Rendering...
Child Rendering...
Child Rendering...
Child Rendering...
Child Rendering...
```

With React.memo(), it is rendering at initial mounting phase that is as expected but you won't see at subsequent rendering.



App.js:

```
import React, { useState } from "react";
import Child from "./Child";

export default function App() {
  const [state, setState] = useState(0);
  const handleOnClick = () => {
    setState(state + 1);
  };
  return (
    <div className="App">
      <h1>React.memo Example</h1>
      <button onClick={() => handleOnClick()}>Click</button>
      <h3>state:{state}</h3>
      <Child />
    </div>
  );
}
```

Child.js:

```
import React from "react";
const Child = () => {
  console.log("Child Rendering...");
};

export default React.memo(Child);
```

Preview:

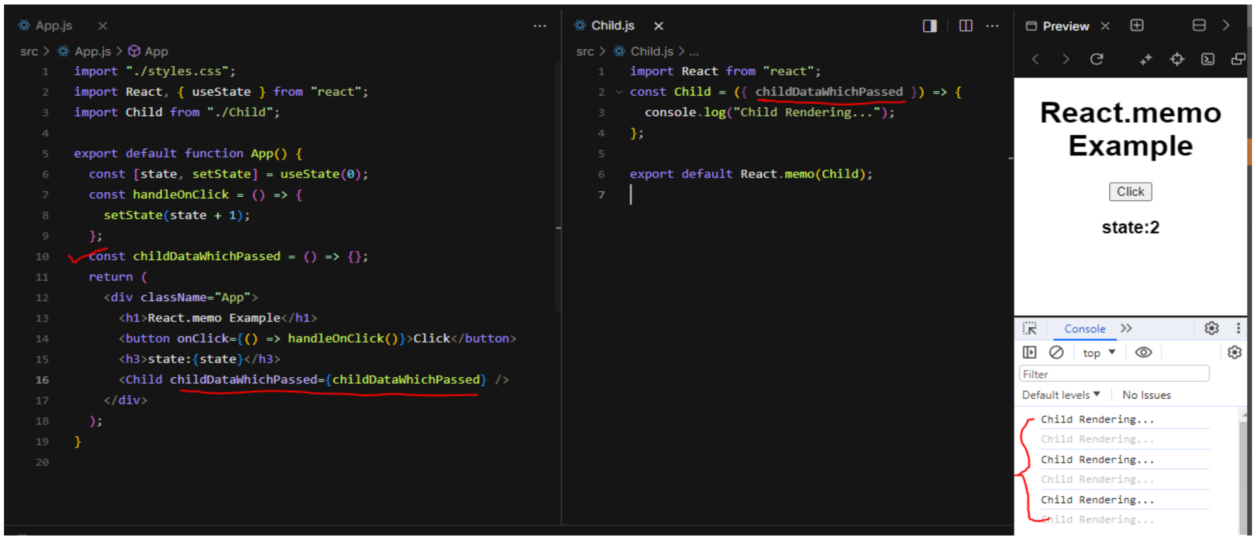
React.memo Example

Click

state:7

```
Child Rendering...
Child Rendering...
```

When we pass a props to the child component, then React.memo() won't work and child component get started to re-render again. This is due to referential equality. When the component rerender then function is also recreated, then the child component think it's recreated means something get change so the Child Component started to rerender.



```
import "./styles.css";
import React, { useState } from "react";
import Child from "./Child";

export default function App() {
  const [state, setState] = useState(0);
  const handleOnClick = () => {
    setState(state + 1);
  };
  const childDataWhichPassed = () => {};
  return (
    <div className="App">
      <h1>React.memo Example</h1>
      <button onClick={() => handleOnClick()}>Click</button>
      <h3>state:{state}</h3>
      <Child childDataWhichPassed={childDataWhichPassed} />
    </div>
  );
}
```

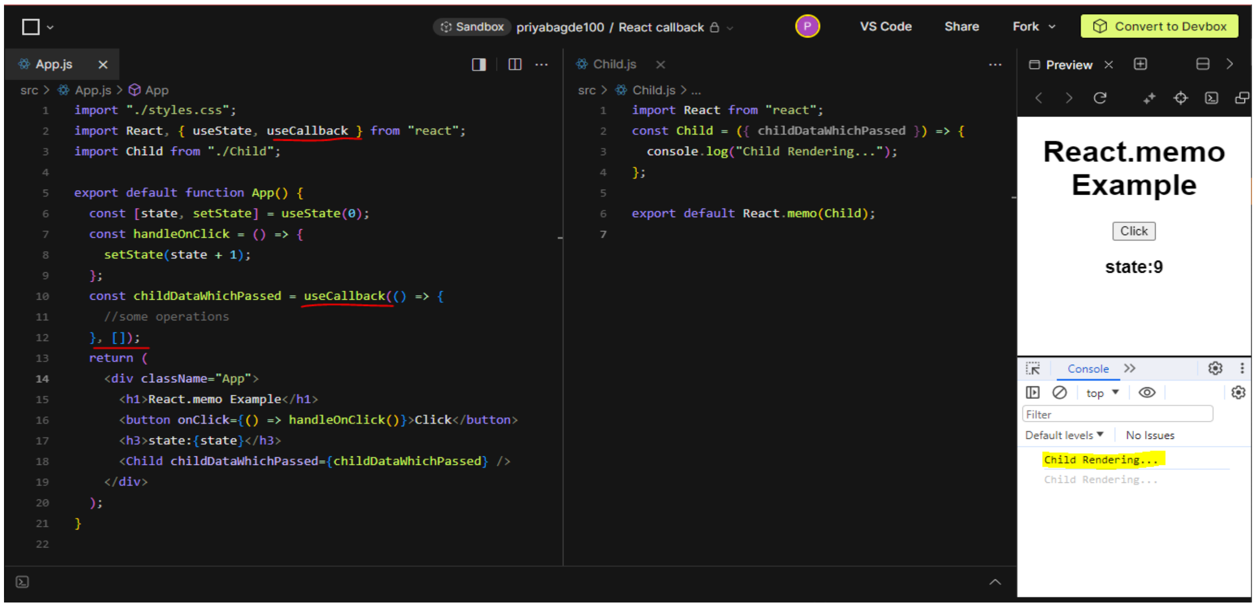
```
import React from "react";
const Child = ({ childDataWhichPassed }) => {
  console.log("Child Rendering...");
};

export default React.memo(Child);
```

```
React.memo Example
Click
state:2
```

```
Child Rendering...
Child Rendering...
Child Rendering...
Child Rendering...
Child Rendering...
Child Rendering...
```

To avoid this, <u>we can use a useCallback</u>. To render at <u>one time so we passed an empty array</u> as a dependency:



```
import "./styles.css";
import React, { useState, useCallback } from "react";
import Child from "./Child";

export default function App() {
  const [state, setState] = useState(0);
  const handleOnClick = () => {
    setState(state + 1);
  };
  const childDataWhichPassed = useCallback(() => {
    //some operations
  }, []);
  return (
    <div className="App">
      <h1>React.memo Example</h1>
      <button onClick={() => handleOnClick()}>Click</button>
      <h3>state:{state}</h3>
      <Child childDataWhichPassed={childDataWhichPassed} />
    </div>
  );
}
```

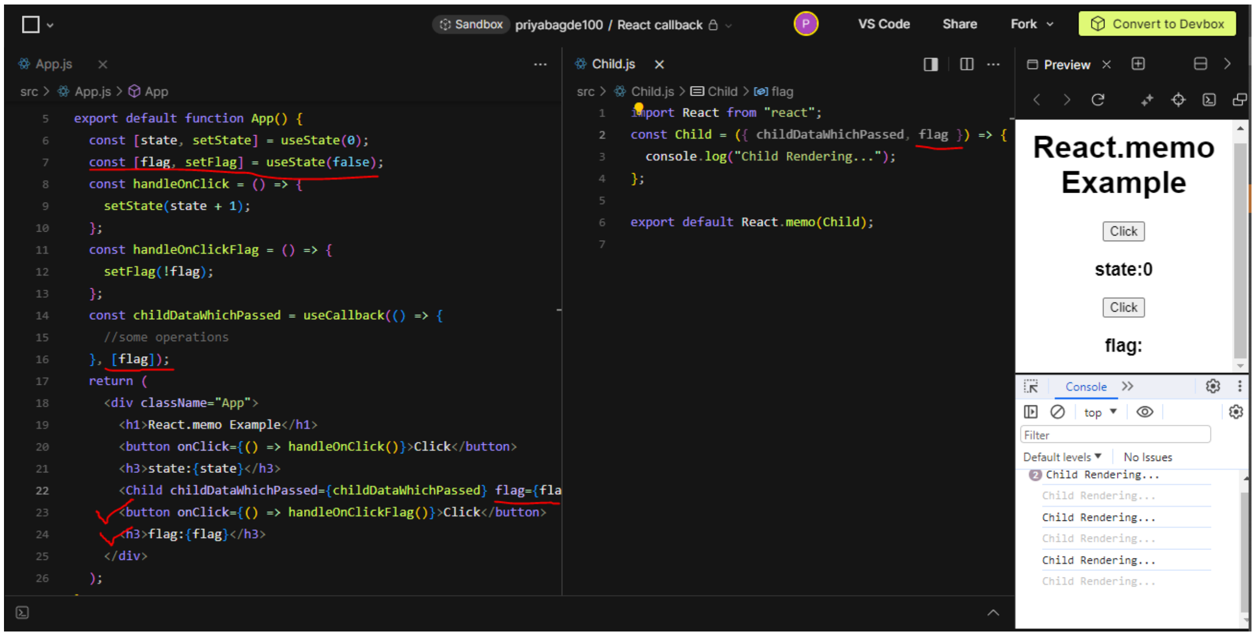
```
import React from "react";
const Child = ({ childDataWhichPassed }) => {
  console.log("Child Rendering...");
};

export default React.memo(Child);
```

```
React.memo Example
Click
state:9
```

```
Child Rendering...
Child Rendering...
```

When we want <u>to render the Child component based on certain conditions/dependencies</u> then you can pass it like below.



```
export default function App() {
  const [state, setState] = useState(0);
  const [flag, setFlag] = useState(false);
  const handleOnClick = () => {
    setState(state + 1);
  };
  const handleOnClickFlag = () => {
    setFlag(!flag);
  };
  const childDataWhichPassed = useCallback(() => {
    //some operations
  }, [flag]);
  return (
    <div className="App">
      <h1>React.memo Example</h1>
      <button onClick={() => handleOnClick()}>Click</button>
      <h3>state:{state}</h3>
      <Child childDataWhichPassed={childDataWhichPassed} flag={fla
      <button onClick={() => handleOnClickFlag()}>Click</button>
      <h3>flag:{flag}</h3>
    </div>
  );
```

```
import React from "react";
const Child = ({ childDataWhichPassed, flag }) => {
  console.log("Child Rendering...");
};

export default React.memo(Child);
```

```
React.memo Example
Click
state:0
Click
flag:
```

```
2 Child Rendering...
Child Rendering...
Child Rendering...
Child Rendering...
Child Rendering...
Child Rendering...
```